In [1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
sns.set()
```

In [2]:
```
agent=pd.read_csv('Agents.csv')
```

In [3]:
```
agent.head(4)
```

Out[3]:

	PersonID	FullName	CustomerCategoryID	CustomerCategoryName	CustomerID	CustomerName
0	3001	Eric Torres	7	Corporate	801	Eric Torres
1	3001	Eric Torres	7	Corporate	801	Eric Torres
2	3001	Eric Torres	7	Corporate	801	Eric Torres
3	3001	Eric Torres	7	Corporate	801	Eric Torres

In [4]:
```
agent.shape
```

Out[4]:
```
(50489, 12)
```

In [5]:
```
#Checked if there is any duplicated columns
agent.duplicated().sum()
```

Out[5]:
```
0
```

In [6]:
```
#Infomation about the dataframe
agent.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 50489 entries, 0 to 50488
Data columns (total 12 columns):
PersonID                50489 non-null int64
FullName                50489 non-null object
CustomerCategoryID      50489 non-null int64
CustomerCategoryName    50489 non-null object
CustomerID              50489 non-null int64
CustomerName            50489 non-null object
BuyingGroupID           50489 non-null int64
AccountOpenedDate       50489 non-null object
CustomerTransactionID   50489 non-null int64
TransactionDate         50489 non-null object
TransactionAmount       50489 non-null float64
IsFinalized             50489 non-null int64
dtypes: float64(1), int64(6), object(5)
memory usage: 4.6+ MB
```

In [7]:
```
#types of the data in which there are encoded
agent.dtypes
```

Out[7]:
```
PersonID                 int64
FullName                object
CustomerCategoryID       int64
CustomerCategoryName    object
CustomerID               int64
CustomerName            object
BuyingGroupID            int64
AccountOpenedDate       object
CustomerTransactionID    int64
TransactionDate         object
TransactionAmount      float64
IsFinalized              int64
dtype: object
```

In [8]:
```
#Checking statistical values of our dataset
agent.describe()
```

Out[8]:

	PersonID	CustomerCategoryID	CustomerID	BuyingGroupID	CustomerTransactionID	Tr
count	50489.000000	50489.000000	50489.000000	50489.0	50489.000000	
mean	3118.620630	4.873854	918.620630	100.0	172150.974608	
std	68.969204	1.420722	68.969204	0.0	96635.242896	
min	3001.000000	3.000000	801.000000	100.0	2.000000	
25%	3059.000000	4.000000	859.000000	100.0	89168.000000	
50%	3118.000000	5.000000	918.000000	100.0	174111.000000	
75%	3176.000000	6.000000	976.000000	100.0	255819.000000	
max	3261.000000	7.000000	1061.000000	100.0	335884.000000	

In [9]:
```
#Converting the TransactionDate to datetime
agent['TransactionDate']=pd.to_datetime(agent['TransactionDate'])
agent['AccountOpenedDate']=pd.to_datetime(agent['AccountOpenedDate'])
```

In [10]:
```
agent.dtypes
```

Out[10]:
```
PersonID                        int64
FullName                       object
CustomerCategoryID              int64
CustomerCategoryName           object
CustomerID                      int64
CustomerName                   object
BuyingGroupID                   int64
AccountOpenedDate      datetime64[ns]
CustomerTransactionID           int64
TransactionDate        datetime64[ns]
TransactionAmount             float64
IsFinalized                     int64
dtype: object
```

Basic EDA

In [11]:
```
'''
Performed a grouby to assigned each Agent to it total amount of transaction done
agent_groub=agent.groupby(by=agent['FullName'])
x=np.round(agent_groub.sum()['TransactionAmount'])
agent['total_amount']=agent['FullName'].map(x)
```

In [12]:
```
#Each Transaction has a unique agent
agent.total_amount.nunique() - agent.FullName.nunique()
```

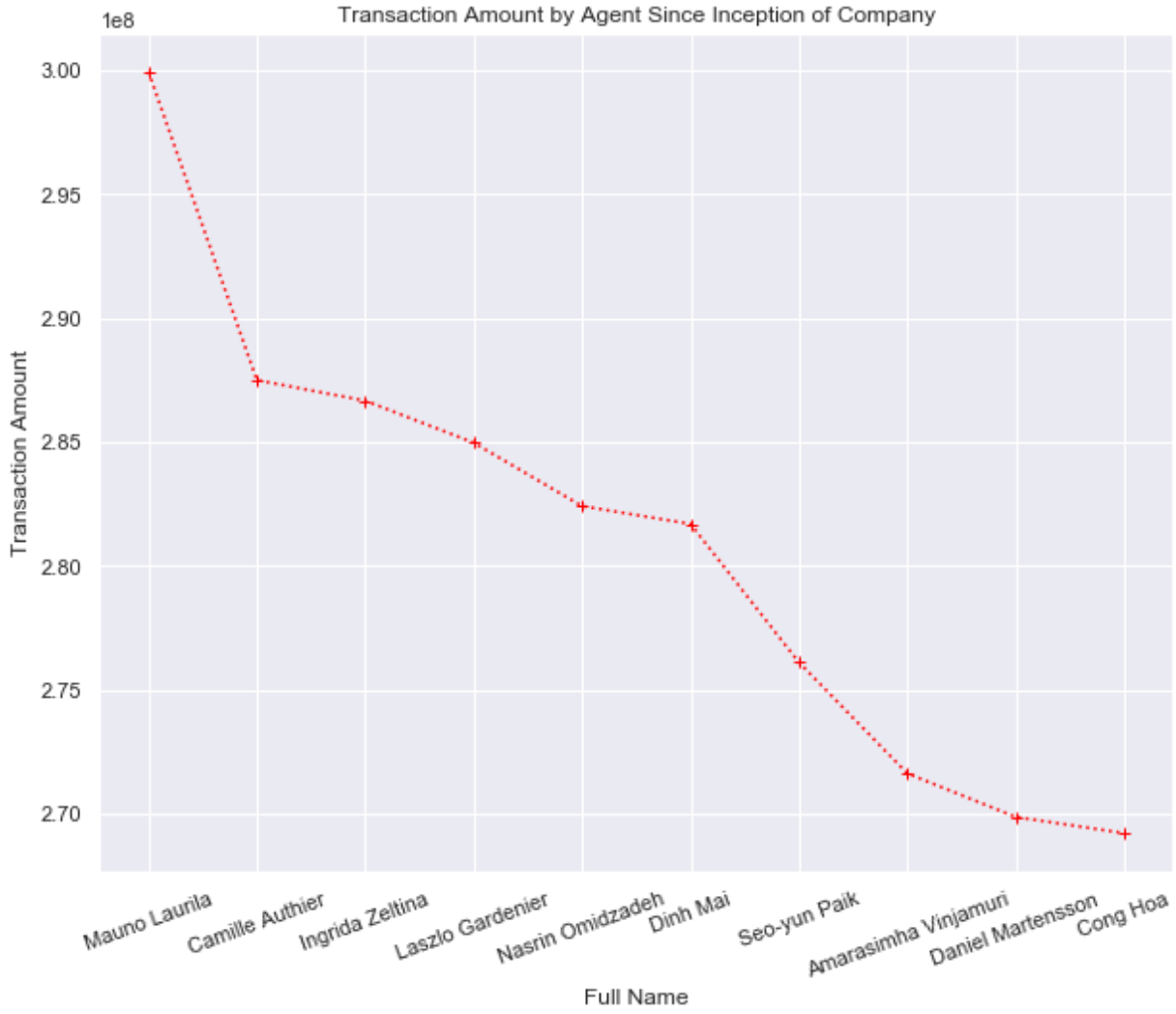
Out[12]:
```
0
```

In [13]:
```

agent[agent.total_amount==299944121].head(5)
```

Out[13]:

	PersonID	FullName	CustomerCategoryID	CustomerCategoryName	CustomerID	CustomerNa
37867	3177	Mauno Laurila	3	Novelty Shop	977	Mauno Lau
37868	3177	Mauno Laurila	3	Novelty Shop	977	Mauno Lau
37869	3177	Mauno Laurila	3	Novelty Shop	977	Mauno Lau
37870	3177	Mauno Laurila	3	Novelty Shop	977	Mauno Lau
37871	3177	Mauno Laurila	3	Novelty Shop	977	Mauno Lau

In [14]:
```
agent_top_10=agent.groupby('FullName').sum().sort_values(by='TransactionAmount',
plt.figure(figsize=(10,8))
plt.xlabel('Full Name')
plt.ylabel('Transaction Amount')
plt.xticks(rotation=20)
plt.title('Transaction Amount by Agent Since Inception of Company')
plt.plot(agent_top_10['TransactionAmount'], color='red', marker='+', linestyle='
plt.show();
```



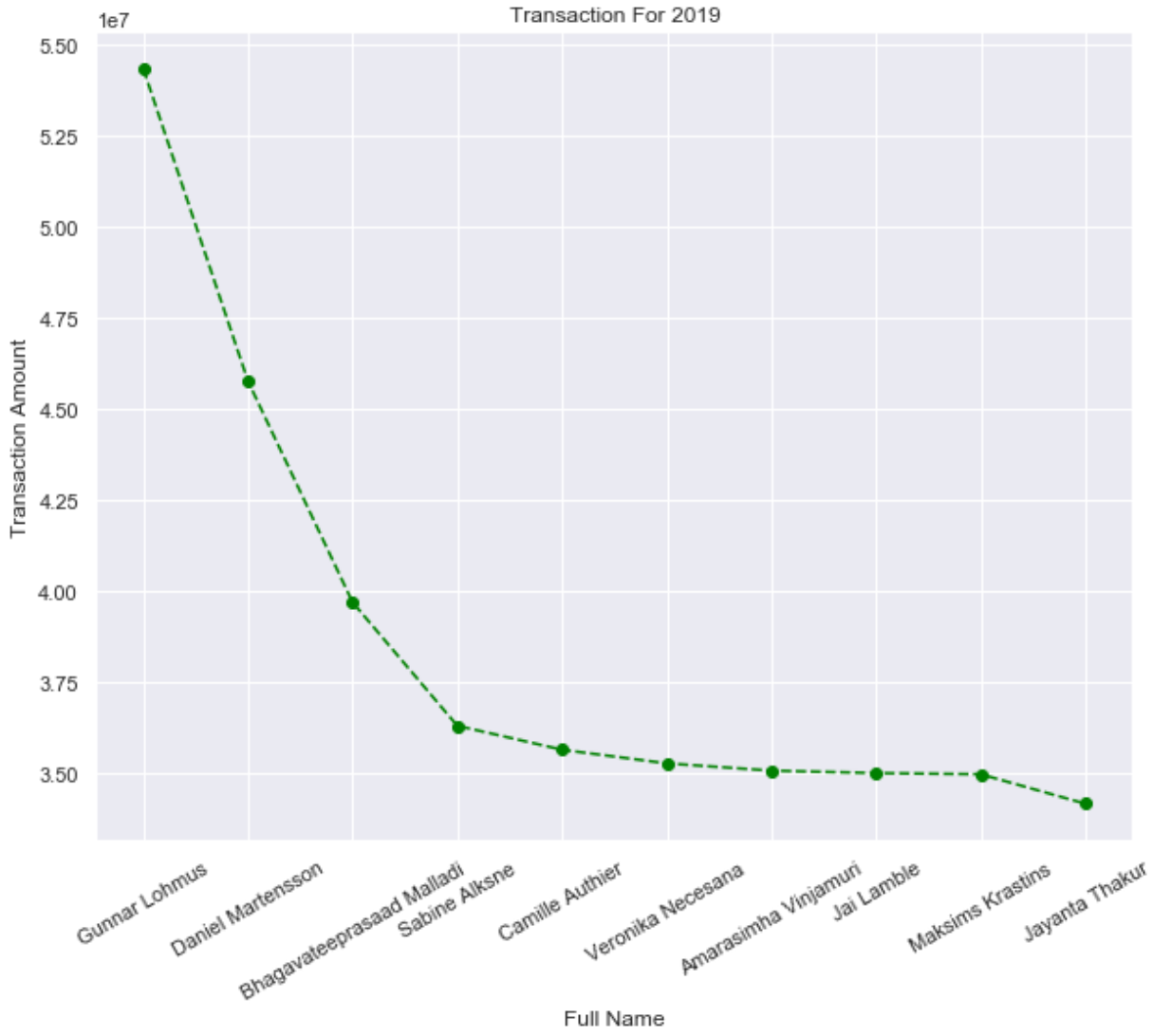
Highest Sale in 2019

In [15]:
```
#create a column for the month column
agent['month']=agent['TransactionDate'].dt.month
agent['year']=agent['TransactionDate'].dt.year
```

In [16]:
```
#Looping through the month column to form a new column quarter in the dataset
quarter=[]
for i in agent['month']:
    if i==1 or i==2 or i==3:
        quarter.append(1)
    elif i==4 or i==5 or i==6:
        quarter.append(2)
    elif i==7 or i==8 or i==9:
        quarter.append(3)
    elif i==10 or i==11 or i==12:
        quarter.append(4)
agent['quarters']=quarter
```

In [17]:
```
agent_2019_quarter4=agent[(agent['year']==2019) & (agent['quarters']==4)]
```

In [18]:
```
agent_quarter_top_10=agent_2019_quarter4.groupby('FullName').sum().sort_values(by
plt.figure(figsize=(10,8))
plt.xlabel('Full Name')
plt.ylabel('Transaction Amount')
plt.xticks(rotation=30)
plt.title('Transaction For 2019')
plt.plot(agent_quarter_top_10['TransactionAmount'],color='green', marker='o', li
plt.show();
```



Agent Raj Verma

In [19]:
```
agent_raj_verma=agent[agent['FullName']=='Raj Verma']
print('Shape of the dataset',agent_raj_verma.shape)
agent_raj_verma.head(4)
```

```
Shape of the dataset (102, 16)
```

Out[19]:

	PersonID	FullName	CustomerCategoryID	CustomerCategoryName	CustomerID	CustomerNa
49602	3243	Raj Verma	7	Corporate	1043	Raj Ve
49603	3243	Raj Verma	7	Corporate	1043	Raj Ve
49604	3243	Raj Verma	7	Corporate	1043	Raj Ve
49605	3243	Raj Verma	7	Corporate	1043	Raj Ve

In [20]:
```
agent_sum=agent_raj_verma[agent_raj_verma['year']==2020]['TransactionAmount'].sur
agent_sum=np.round(agent_sum/1000000, decimals=2)
print('Total Amount of Transaction Carried out by Agent Raj Verma for the First (
```

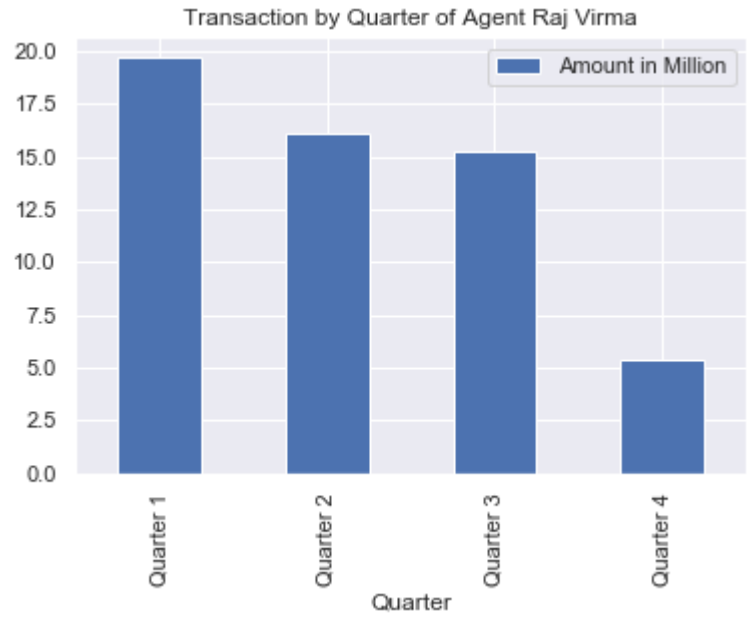
```
Total Amount of Transaction Carried out by Agent Raj Verma for the First Quater
of 2020: 29.63 Million
```

In [21]:
```
quarter_1=agent_raj_verma[(agent_raj_verma['year']==2019) &(agent_raj_verma['quar
quarter_2=agent_raj_verma[(agent_raj_verma['year']==2019) &(agent_raj_verma['quar
quarter_3=agent_raj_verma[(agent_raj_verma['year']==2019) &(agent_raj_verma['quar
quarter_4=agent_raj_verma[(agent_raj_verma['year']==2019) &(agent_raj_verma['quar

(quarter_1, quarter_2, quarter_3, quarter_4)=np.round(quarter_1/1000000, decimals

print(f'Transaction for quarter 1 {quarter_1}Million')
print(f'Transaction for quarter 2 {quarter_2}Million')
print(f'Transaction for quarter 3 {quarter_3}Million')
print(f'Transaction for quarter 4 {quarter_4}Million')
```

```
Transaction for quarter 1 19.67Million
Transaction for quarter 2 16.15Million
Transaction for quarter 3 15.29Million
Transaction for quarter 4 5.38Million
```

In [22]:
```
#Created a new dataframe for the quarter columns
quarter_data={'Quarter':['Quarter 1', 'Quarter 2', 'Quarter 3', 'Quarter 4'], 'Ar
quarter_data=pd.DataFrame(quarter_data)
```

In [23]:
```
quarter_data.plot(x='Quarter', y='Amount in Million', kind='bar',
                  legend=True,title='Transaction by Quarter of Agent Raj Virma')
```



In [ ]:

In [ ]:

SUPPLIER EVALUATION

In [24]:
```
supplier=pd.read_csv('DSuppliers.csv')
```

In [25]:
```
supplier.head(4)
```

Out[25]:

	SupplierID	SupplierName	SupplierCategoryID	PrimaryContactPersonID	PaymentDays	SupplierTi
0	1	A Datum Corporation	2	21	14	
1	1	A Datum Corporation	2	21	14	
2	1	A Datum Corporation	2	21	14	
3	1	A Datum Corporation	2	21	14	

In [26]:
```
#Checked if there is any duplicated columns
supplier.duplicated().sum()
```

Out[26]:
```
0
```

In [27]:
```
supplier.shape
```

Out[27]:
```
(2070, 11)
```

In [28]:
```
supplier.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2070 entries, 0 to 2069
Data columns (total 11 columns):
SupplierID                2070 non-null int64
SupplierName              2070 non-null object
SupplierCategoryID        2070 non-null int64
PrimaryContactPersonID    2070 non-null int64
PaymentDays               2070 non-null int64
SupplierTransactionID     2070 non-null int64
PurchaseOrderID           2070 non-null int64
SupplierInvoiceNumber     2070 non-null int64
TransactionAmount         2070 non-null float64
IsFinalized               2070 non-null int64
SupplierCategoryName      2070 non-null object
dtypes: float64(1), int64(8), object(2)
memory usage: 178.0+ KB
```

In [29]:
```
supplier.dtypes
```

Out[29]:
```
SupplierID                 int64
SupplierName              object
SupplierCategoryID         int64
PrimaryContactPersonID     int64
PaymentDays                int64
SupplierTransactionID      int64
PurchaseOrderID            int64
SupplierInvoiceNumber      int64
TransactionAmount        float64
IsFinalized                int64
SupplierCategoryName      object
dtype: object
```

In [30]:
```
#Checking statistical values of our dataset
supplier.describe()
```

Out[30]:

	SupplierID	SupplierCategoryID	PrimaryContactPersonID	PaymentDays	SupplierTransaction
count	2070.000000	2070.000000	2070.000000	2070.000000	2070.0000
mean	5.471014	4.446860	29.942029	29.849758	161965.4787
std	1.571520	0.571455	3.143041	1.568521	97670.0245
min	1.000000	2.000000	21.000000	7.000000	134.0000
25%	4.000000	4.000000	27.000000	30.000000	76456.7500
50%	4.000000	4.000000	27.000000	30.000000	158888.0000
75%	7.000000	5.000000	33.000000	30.000000	247217.0000
max	12.000000	5.000000	43.000000	30.000000	335510.0000

In [31]:
```
#Checking for the total number of supplier Name of all products
print('Number of Suppliers:',supplier.SupplierName.nunique())
supplier.SupplierName.value_counts()
```

```
Number of Suppliers: 7
```

Out[31]:
```
Fabrikam, Inc.              1053
Litware, Inc.                983
Graphic Design Institute      13
Northwind Electric Cars       10
A Datum Corporation            5
The Phone Company              5
Contoso, Ltd.                  1
Name: SupplierName, dtype: int64
```

In [32]:
```
#Checking for the total number of products
print('Number of Unique Products:',supplier.SupplierCategoryName.nunique())
supplier.SupplierCategoryName.value_counts()
```

```
Number of Unique Products: 4
```

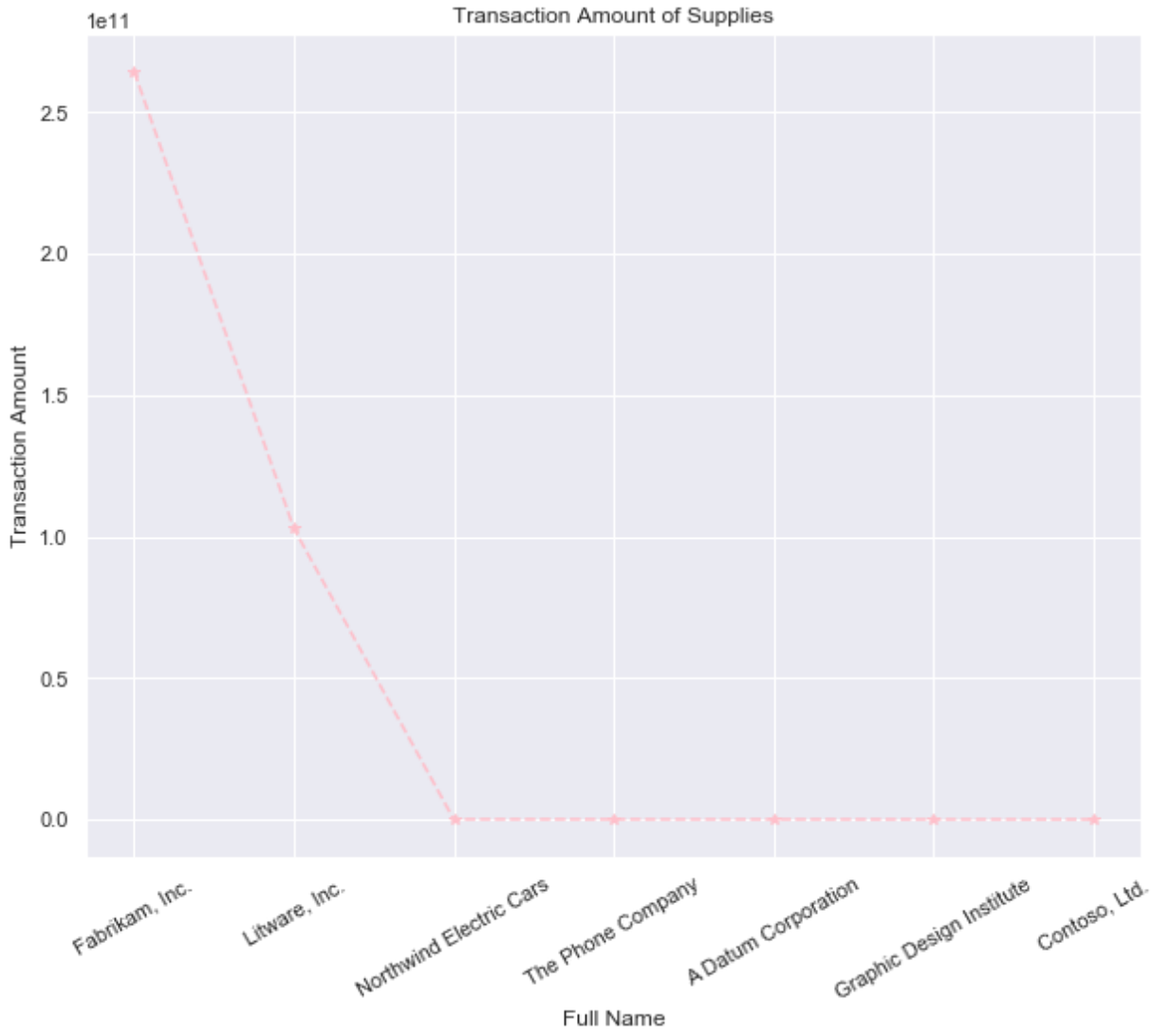
Out[32]:
```
Clothing Supplier         1053
Packaging Supplier         983
Novelty Goods Supplier      24
Toy Supplier                10
Name: SupplierCategoryName, dtype: int64
```

In [33]:
```
supplier_name=supplier.groupby('SupplierName').sum().sort_values(by='Transaction/
supplier_name
```

Out[33]:

SupplierName	SupplierID	SupplierCategoryID	PrimaryContactPersonID	PaymentDays	SupplierTrans
Fabrikam, Inc.	4212	4212	28431	31590	17
Litware, Inc.	6881	4915	32439	29490	16
Northwind Electric Cars	100	30	390	300	
The Phone Company	60	10	215	150	
A Datum Corporation	5	10	105	70	
Graphic Design Institute	65	26	377	182	
Contoso, Ltd.	2	2	23	7	

In [34]:
```
plt.figure(figsize=(10,8))
plt.xlabel('Full Name')
plt.ylabel('Transaction Amount')
plt.xticks(rotation=30)
#plt.legend()
plt.title('Transaction Amount of Supplies')
plt.plot(supplier_name['TransactionAmount'],color='pink', marker='*', linestyle=
plt.show();
```



In [35]:
```
total_amt=(supplier.TransactionAmount.sum())/1000000000
total_amt=np.round(total_amt, decimals=2)
print('Total Money Spent on supplies:',total_amt,'Billion')
```

```
Total Money Spent on supplies: 367.46 Billion
```

In [36]:
```
agent.to_csv('Agents_new.csv')
```

In [ ]:
```

```

I hope it is comprehensive Enough

In [ ]:
```

```